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Hisashi Saiga et al.

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For: DATA DISPLAYING DEVICE

Examiner: H. Shih

CLAIM FOR PRIORITY AND SUBMISSION OF DOCUMENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicants hereby claim priority under 35 U.S.C. 119 based on the following prior foreign applications filed in the following foreign countries on the dates indicated:

<u>Country</u>	<u>Application No.</u>	<u>Date</u>
Jaspan	10-171569	March 20, 1998
Japan	10-078757	March 26, 1998
Japan	10-085400	March 31, 1998

In support of this claim, verified English language translations of each of the previously submitted certified copies of the foregoing foreign priority documents are enclosed.

Dated: April 17, 2007

Respectfully submitted,

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VERIFICATION OF TRANSLATION

A certified copy of Japanese Patent
Application Nos. 10-071569, 10-078757 and 10-085400

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the attached documents and I state that the following
is a true translation to the best of my knowledge
and belief.

Dated this 12th day of April, 2007


Hiroyuki KAWABE

[Document's Name]	Patent Application
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[Title of the Invention]

DATA DISPLAYING DEVICE AND METHOD AND STORAGE MEDIUM WITH DATA
TO BE DISPLAYED

[Claims]

[Claim 1] A data displaying device comprising a storage means with data stored therein, a display means for displaying the data and a display control means for controlling display of the data stored in the storage means on the data display means, characterized in that a remark display control means is also provided for displaying a visual confirmation guide for distinguishing a specified area of data being displayed on the display means visually.

[Claim 2] A data displaying device as defined in claim 1, characterized in that the remark display control means displays the visual confirmation guide superposed on data being displayed on the display means.

[Claim 3] A data displaying device as defined in claim 1 or 2, characterized in that the remark display control means distinguishes visibility of data being displayed with the visual confirmation guide superposed thereon by deforming the data or adding information thereto and displays the distinguished in visibility data with the superposed visual confirmation guide.

[Claim 4] A data displaying device as defined in any one of claims 1 to 3, characterized in that the remark display control

means moves and displays the visual confirmation guide being displayed.

[Claim 5] A data displaying device as defined in any one of claims 1 to 3, characterized in that the remark display control means deforms and displays the visual confirmation guide being displayed.

[Claim 6] A data displaying device as defined in claim 4 or 5, characterized in that the remark display control means simultaneously deforms, moves and display the visual confirmation guide being displayed.

[Claim 7] A data displaying device as defined in any one of claims 1 to 6, characterized in that the remark display control means, prior to moving and displaying the visual confirmation guide, refers to a preset moving speed and moves and displayed the visual confirmation guide by using the preset moving speed.

[Claim 8] A data displaying device as defined in any one of claims 1 to 7, characterized in that the remark display control means, prior to moving and displaying the visual confirmation guide, refers to a preset moving distance and deforms and displays the visual confirmation guide by using the preset moving distance.

[Claim 9] A data displaying device as defined in any one of claims 1 to 8, characterized in that the remark display control means begins moving in a specified direction or deforming the displayed visual confirmation guide being still in stopped or not deformed state or stops moving in the specified direction

or deforming the displayed visual confirmation guide being displaced or deformed.

[Claim 10] A data displaying device as defined in any one of claims 1 to 9, characterized in that the remark display control means erases the visual confirmation guide being displayed.

[Claim 11] A data displaying device as defined in any one of claims 1 to 10, characterized in that the remark display control means moves or deforms the visual confirmation guide at a speed based on complexity of data being displayed within the visual confirmation guide.

[Claim 12] A data displaying device as defined in any one of claims 1 to 10, characterized in that the remark display control means moves or deforms the visual confirmation guide at a speed based on frequency of data being displayed within the visual confirmation guide.

[Claim 13] A data displaying device as defined in any one of claims 1 to 12, characterized in that the remark display control means moves or deforms the visual confirmation guide at a speed based on a combination of the complexity with the frequency of data being displayed within the visual confirmation guide.

[Claim 14] A data displaying method comprising a data storing step for storing data, a displaying step for displaying the data and a display control step for controlling display of data stored in a data storage means on a data display means, wherein a remark display control step is also provided for displaying a visual confirmation guide for distinguishing a specified area

of data being displayed by the displaying step visually.

[Claim 15] A data storage medium containing a record of data display program readable by a computer to realize a function for displaying visual confirmation guide using a difference in visibility, a function for distinguishing displayed data by the displayed visual confirmation guide visually and a function for moving or deforming the visual confirmation guide at a speed preset according to complexity or frequency of displayed data to make easier to read the remark displayed data.

[Detailed Description of the invention]

[0001]

[Technical Field to which the Invention Pertains]

The present invention relates to a data displaying device or an electronic book displaying device and more specifically to a data displaying device or an electronic book displaying device for displaying document data consisting of characters or images stored on a storage medium.

[0002]

[Prior Art]

Japanese Laid-Open Patent Publication No.07-182325 discloses a document data displaying device that comprises a document storage means for storing document data (corresponding to display data used for the present invention), a sound data designating means for designating a record of sound data responding to the document data recorded on the storage means and a document data displaying means for recognizing the

document data responding to an input sound data designated by the sound data designating means and displaying the recognized document data. For example, this prior art first specifies the recording of sound data in accord with a specified document data to record the sound data on a sound data storage medium in the specified relation with the document data. The above recording method permits simultaneous reproduction of sound and document data in the given relationship. Namely, when any portion of document data being displayed on a screen is designated by placing a cursor key thereon, the data portion is distinguished visually by reverse way and, at the same time, corresponding sound data is recognized and output through a sound output means. When a sound signal is first reproduced, a document data portion corresponding to the sound signal is distinguished visually (by reverse way) on the display screen, allowing a user to easily recognize the text corresponding to the sound signal being reproduced.

[0003]

It is well known that a word processor can emphasize a specific character string or a specific character area in various manners. For example, a character, word, line, sentence, paragraph or an image is specified and emphasized by underlining, reversing and marking or by changing the size or point number or color of the current font to another or by using a 3D image or by gradating or by changing the style to emphasized characters like bold and italic or ornamental characters like

emboss. This method consists of two steps of first specifying with a mouse an area to be emphasized and of second deforming characters or an image therein.

[0004]

Electronic books and electronic book displaying devices (electronic book players) are also widely known. A typical one is a portable book device comprising a storage means for storing a document (e.g., a dictionary, novel etc.), a displaying means for displaying the content of the storage means on a display screen and a display control means for controlling the display means.

[0005]

[Problems to be solves by the Invention]

However, the prior art disclosed in Japanese Laid-Open Patent Publication No.07-182325, which concerns an emphatically displaying method by representing in opposite tone to the background, is intended to distinguish document data corresponding to sound output data visually and does not possess an emphatic function to facilitate reading of document data by remark display.

[0006]

The above art varies remark positions on document data according to a sound output signal rate and cannot move the remark position on the document data in accord with its content.

[0007]

The same art limits the emphatic method to representing in

opposite tone to the background and does not allow a user to selectively use any of emphatic methods in accord with surrounding conditions or by preference.

[0008]

The same art moves an emphatically displayed document data by a unit character corresponding to a sound output but cannot distinguish a line, sentence, paragraph and section of the document visually, which is over in length of a unit character.

[0009]

The same art cannot control timings of presenting remark display.

[0010]

The same art cannot dynamically vary a remark area of document data in accord with the document data or by user's preference.

[0011]

The same art cannot adjust the moving speed of emphasized document data in accord with a user's reading speed.

[0012]

The same art cannot move the emphasized portion in the reverse direction.

[0013]

The same art involves a problem that an emphasis cannot be deleted.

[0014]

The same art has merely statically emphasized portion and

cannot move the emphasis at a speed suitable for a user.

[0015]

The character and image remark method used for word processors comprises two steps of specifying an area and deforming (distinguishing visually) of the specified area of characters or an image and requires setting for two steps every time of emphasis. This complicates the use of the remark function.

[0016]

A problem with the portable type electronic book devices is that one often fails in following the correct lines of a text with many and small characters or a complicated text being displayed on a screen. For example, users may read the document with erroneously skipping a line or reading again the same line.

[0017]

The prior art and known methods cannot allow the user to easily read an electronic book on the electronic book player in an electric train because of fluctuation of a screen.

[0018]

The prior art and known methods cannot vary a moving speed and deformation degree of a remark position in accord with understanding of the document by the user.

[0019]

Accordingly, a primary object of the present invention is to provide a data display or an electronic book device, which is simple to distinguish document data visually and allows a

reader (user of the device) to easily follow with his or her eyes characters in lines depending on the environment where the user uses the device and the understanding of the displayed document data.

[0020]

[Means for solving Problem]

A data displaying device according to the present invention (claim 1 to claim 13) comprises a storage means with data stored thereon, a displaying means for displaying the data and a display control means for controlling the outputting of the data stored on the storage means onto the displaying means and featured by further providing a remark display control means for displaying a visual confirmation guide for distinguishing a specified range of display data on the displaying means visually. The remark display control means can display the visual confirmation guide over the data being displayed on the displaying means. The same control means can produce a visual difference of the display data from the visual confirmation guide overlaid thereon by deforming the display data or adding information thereto and can display the distinguished display data over the visual confirmation guide.

[0021]

The same control means can move the visual confirmation guide being displayed on the display screen. The same control means can display the visual confirmation guide in a deformed (modified) form on the display screen. The same control means

can display a deformed visual confirmation guide by moving it on the display screen.

[0022]

The remark display control means can recognize a preset moving speed before moving a visual confirmation guide and can display the guide by moving it at the preset moving speed on the display screen. The same control means can recognize a preset moving distance before displaying the visual confirmation guide and can display the visual confirmation guide by deforming it according to the recognized moving distance. The same control means starts moving or deforming of a visual confirmation guide being displayed on the screen if the visual confirmation guide is not moved in a specified direction or not deformed. On the contrary, the same control device stops moving or deforming of the visual confirmation guide if the guide is moving in a specified direction or it is being deformed.

[0023]

The same control means can delete the visual confirmation guide being indicated on the display screen. It can also move or deform the visual confirmation guide at a specified speed based on the complexity of data contained in the guide. The same control device can move or deform the visual confirmation guide at a specified speed based on the frequency of occurrence of data in the guide. It can further move or deform the visual confirmation guide at a speed adjusted based on both the

complexity and the occurrence frequency of data displayed in the guide.

[0024]

A data displaying method according to the present invention (claim 14) comprises a data storing step a data displaying step and a data display control step for outputting data from a memory means onto a display means and is characterized by further including a remark display control step for displaying a visual confirmation guide for distinguishing a specified area of display data in the data displaying step visually.

[0025]

A data display program according to the present invention (claim 15) includes a function of displaying a visual confirmation guide using a differential visibility of an object, a function of remark display data by the visual confirmation guide being displayed and a function of moving or deforming the visual confirmation guide at a speed predetermined based on the complexity and/or frequency of occurrence of the display data. The program is performed by a computer to facilitate a user to easily read display data with emphasis on a display screen.

[0026]

[Modes of carrying out the Invention]

(Embodiment 1)

Figure 1 is a functional block diagram of a first embodiment of the present invention. In Fig. 1, a storage means 101 that

can be composed of a magnetic storage medium such as a CD-ROM or a semiconductor memory such as a IC card. Display data stored in the storage means 101 is read therefrom by a display control device 103 to display on a display means 102 such as a LCD, CRT and plasma display.

The display control means 103 converts each character string of the display data into corresponding character font patterns or performs expansion or resolution conversion of the display image data as necessary and then displays the data on the display means 102. The term "display control means 103" is used to represent a total control means for controlling an entire process of displaying image data on the display means. For example, the same control means may be a central processing unit (CPU) in a particular case. A remark display control means 104 is used to emphasize display data being displayed on the display means 102 by overlaying a visual confirmation guide thereon. The display means of the present invention may be of two or three dimensional type. The embodiment with two dimensional type display means 102 will be described below for the sake of simplicity of explanation.

[0027]

Figure 2 shows an exemplary structure of data for presenting a visual confirmation guide. In Fig. 2, numeral 201 designates a data item (entry) indicating start address information for starting the visual confirmation guide. An address for the two dimensional image can be represented by a set of coordinate

values (X1, Y1). Numeral 202 designates a data item indicating end address information (X2, Y2) for ending the visual confirmation guide. The visual confirmation guide has an area restricted by points (X1, Y1) and (X2, Y2). Item 203 defines the polarity of the visual confirmation guide area. The visual confirmation guide area with positive polarity is an area specified by (X1, Y1) and (X2, Y2). The visual confirmation guide area with negative polarity is an area determined by subtracting the area specified by (X1, Y1) and (X2, Y2) from a whole image area. A data item 204 stores pattern information of the visual confirmation guide, which is used for selecting for example a guide area pattern such as a uniform color of a whole area, a rectangle frame, additional triangle and so on.

[0028]

A data item 205 stores information relating to the type of deformation process to be made on display data within the visual confirmation guide area. The information may include for example a magnification factor, a rotation angle and the like. A data item 206 stores information for changing the attributes of display data within the visual confirmation guide area. The information may include for example a font color, font type, image gradation and the like.

[0029]

A data item 207 stores information for defining an interval of displaying the visual confirmation guide, which includes

information such as, for example, "flashing at an interval of 5 seconds", "Progressively changing" and "No change". A data item 208 stores information for managing the location of the visual confirmation guide. This information includes such information as "within", "before", "after" and "within plus after" a specified area. "Within" means an area surrounded by a boundary defined by (X1, Y1) and (X2, Y2). "Before" means a front area in front of the area specified by (X1, Y1) and (X2, Y2). Namely, the front area is an area defined by a left top starting point on the display screen and an end point just before the area specified by (X1, Y1) and (X2, Y2). Items (entries) 201 to 207 can be managed as a data array or a table.

[0030]

Fig. 3(a) to Fig. 3(c) are views for explaining a method of distinguishing a display data visually by representing in inverse color, wherein display data is displayed on the display means by the display control means or the remark display control means. Fig. 3(a) shows display data being displayed with no emphasis. Fig. 3(b) shows display data being displayed with a Japanese Kanji character "示" distinguished by representing in inverse color. Fig. 3(c) shows display data being displayed with a remark line beginning from Japanese Kanji character "籍" by representing in inverse color. The area distinguished by representing in inverse color corresponds to a visual confirmation guide. The visual confirmation guide (i.e., an area to be emphasized) can be set to cover any of a whole page

(screen image), character(s), word(s), sentence(s) and paragraph(s).

[0031]

Fig. 4(a) to Fig. 4(j) show exemplary remark display images other than the examples of Figs. 3(b) and 3(c). Fig. 4(a) shows an example of remark display on the basis of one character units by changing their font styles, wherein Japanese kanji character "示" is displayed in a font style different from other characters. Fig. 4(b) shows an example of remark display data by using a changed font style, wherein a line beginning from a character "籍" is displayed in a font style different from the other lines. Fig. 4(c) shows an example of distinguishing an area other visually than an area covered by a visual confirmation guide in such a manner that a visual confirmation guide is temporarily put on a line beginning from a character 籍 to be emphasized and then changed to cover an area other than the above specified line by changing the polarity of the guide area to negative, wherein the area newly covered by the visual confirmation guide is further weakened in its visibility by a specified pattern or processing to distinguish the specified line in contrast with the weakened area within the visual confirmation guide. Fig. 4(d) shows an exemplary emphasis of the same line of Fig. 4(c) by causing the display data covered by the visual confirmation guide not to be displayed on the display screen.

[0032]

Fig. 4(e) shows an example of distinguishing a unit character visually in an enlarged scale (e.g., a Japanese character “示” in the shown case) in the display image. Fig. 4(f) shows an example of distinguishing a line visually by putting a mark just before the beginning of the line. Fig. 4(g) shows an exemplary remark display obtained by putting a visual confirmation guide on a character “示”, setting its location to “after” the specified area and setting the visual confirmation guide pattern to “white”. Fig. 4(h) shows an exemplary remark display obtained by applying the same method of Fig. 4(g) to a line beginning from a character “籍”. Fig. 4(i) shows an exemplary remark display of a line by enclosing the line by a rectangle. Fig. 4(j) shows an exemplary remark display of a line by drawing an underline along there.

[0033]

As described above, a variety of emphasis of respective display units can be realized by changing the visual confirmation guide parameter values in the table shown in Fig. 2, displaying the visual confirmation guide over a specific unit of data being displayed on the display screen and deforming the display data within the visual confirmation guide area or adding information for causing a difference in visibility of the specified area of display data from the remaining area. The examples shown in Figs. 3 and 4 are merely descriptive and have no intention to restrict a scope of the remark display according to the present invention.

[0034]

Fig. 5 is a flowchart depicting a procedure of realizing examples of remark display of Figs. 3(b) to 3(c) or Figs. 4(a) to 4(j). Referring to the data structure of Fig. 2 and Figs. 6(a) to 6(d) (development of Fig. 4(d)), the remark display procedure of Fig. 5 will be described below.

[0035]

Step S101 is a processing module for setting an area to be displayed with emphasis, which area is designated by a user or the remark display control means. For example, the user designates a point (X1, Y1) 601 and a point (X2, Y2) 602 (Fig. 6) by using a pointing device. These values are accumulated in the visual confirmation guide start address and the visual confirmation guide end address (Fig. 2), which are retrieved by the remark displaying device. The values (X1, Y1) and (X2, Y2) are transferred by the remark display control device to the display control means that in turn determines a rectangular area 603 surrounding by (X1, Y1) and (X2, Y2) (Fig. 6(b)) from page buffer addresses (X1, Y1) (X2, Y2). Although the points (X1, Y1) (X2, Y2) were designated by the user with a pointing point in the above instance, they are usually designated by the remark display control means (by the user's request or default setting of the remark display control means). In this case, a unit area to be displayed with emphasis is any of: a whole screen image, a character, n characters, a word, a line, a sentence and a paragraph. Although the area to be emphasized

was designated in the shape of a rectangle, it may have an elliptical shape or a circular shape.

[0036]

The remark display control means refers to the visual confirmation guide polarity information 203. In this instance, the visual confirmation guide is assumed to be of negative polarity. The remark display control means obtains the negative polarity information and causes the display control means to specify a opposite tone area 604 of the above determined rectangular area 603 (Step S102).

[0037]

Then, the remark display control means refers to the visual confirmation guide location information 208 (Fig. 2). In this instance, the information is "within the specified area" meaning that the area designated before is defined as an area to be emphasized. Thus, the visual confirmation guide area 604 is decided (Step S103).

[0038]

The remark display control means refers to the visual confirmation guide pattern information 204. In the shown case, the pattern is "whitening". Having obtained information "whitening", the remark display control means instructs the display control means to clear the page buffer information in the defined visual confirmation guide area 604. The display control means executes the whitening processing (Step S104).

[0039]

The remark display control means refers to the data deforming information 205. In the shown instance, the information is "No change" meaning that no deformation is made on the data within the visual confirmation guide area. If any type of deformation is designated, the remark display control means generates an instruction to do the specified type of deformation of the data and causes the display control means to execute the instruction (Step S105).

[0040]

The remark display control means refers to the data attributes changing information 206. In this case, the information is "No change" meaning that any attributes of data within the visual confirmation guide area is not changed. If any type of attributes change is designated in the data item, the remark display control means instructs the display control means to execute the specified attributes changing processing (Step S106).

[0041]

The remark display control means refers to the interval information 207. In this case, the information is "No interval" meaning that display data within the visual confirmation guide area is displayed with no interval. If the information 207 is "Blinking 10 times at intervals of 2 seconds and then blinker OFF", the visual confirmation guide area blinks 10 times at 2-second intervals and then returns to its usual state. This may serve as a bookmark put between pages.

[0042]

Fig. 6(d) shows a screen image displayed on the display means after execution of the above processing steps. Finally, the line 605 is displayed (Step S108). This is an exemplary emphasis of a line specified by the user by reducing the visibility of all screen area except for the specified line area (deleting the information other than the line in the shown case) with no processing of the specified display data area.

[0043]

Step S109 is a routine for deciding whether to cease or continue the remark display processing. With decision to "finish", the finish processing is executed (Step S110). With instruction for "Continuation", the necessary data is stored and settings for reading subsequent data set will be executed for the next remark display (Step S111).

[0044]

Claims 1 to 3 can be realized by the above method and processing flow.

[0045]

(Embodiment 2)

Fig. 7 shows an exemplary data structure for realizing the second embodiment of the present invention (claim 4 to claim 10). Data item 701 is a unit of movement of the visual confirmation guide, e.g., it includes a unit specified as a character, n characters, a word, a line, a sentence, a paragraph, a chapter and a page. Data item 702 includes information

specifying a moving speed of the visual confirmation guide based on a movement unit specified in Data item 701. Data item 703 stores information about the visual confirmation guide movement pattern (e.g., movement at a constant speed, with a start acceleration and end deceleration or with a pause) or parameter values set for the specified movement pattern. Data item 704 stores information about deformation of the visual confirmation guide. When deformation is set in this data item, the visual confirmation guides corresponding to the number of states are set. With no deformation set in the data item, an initially set visual confirmation guide is defined as an object to be processed. The term "deformation" used herein has two different concepts. The first concept is modification of data being displayed, for example, by rotation of character data and enlargement of image data. The second concept is modification of a visual confirmation guide, for example, by changing its area.

[0046]

Data item 705 stores the deformation changing pattern information. If plural deformations of the visual confirmation guide may be desired, information indicating the type (order) of transition of states is set in this data item. For example, information is set to specify that a visual confirmation guide A is first displayed for 6 seconds and a visual confirmation guide B is then displayed. This data item can also include information for example for applying the deformation while

moving the visual confirmation guide in relation with the movement information set in the data item 703. This may create such a remark display image showing waves rippling out in all directions in a pond when one threw a stone therein.

[0047]

Data item 706 stores information on a moving direction of the visual confirmation guide. The visual confirmation guide can move in forward and reverse directions. Data item 707 stores start/stop control information. The movement or deformation of the visual confirmation guide can be started with "start" information and can be stopped with "stop" information. Data item 708 stores visual confirmation guide control information. This is usually set as "not cleared". If the information indicates "Cleared" state, the visual confirmation guide is deleted, the remark display is deleted and the usual display image is displayed. The above data structure can be easily implemented in the form of a table or a data array.

[0048]

The management of controlling the start/stop information or the visual confirmation guide information can be achieved by using respective switching means. For example, the start switch is provided to start the movement or deformation of the visual confirmation guide and the stop switch is provided to stop the movement or deformation of the visual confirmation guide. The clearing switch is used to clear the visual confirmation guide from the display screen.

[0049]

Figures 8(a) to 8(d) show examples of display images wherein the visual confirmation guide moves. Fig. 8(a) and Fig. 8(b) show exemplary remarks of 5 characters-unit in the image. In Fig. 8(a), the visual confirmation guide moves by five characters at a time. In Fig. 8(b), the visual confirmation guide covering 5 characters moves by one character at a time.

[0050]

Figures 8(c) and 8(d) show exemplary remark displays of three lines-unit in the respective images. In Fig. 8(c), the visual confirmation guide covering three lines moves by three lines at a time. In Fig. 8(d), the visual confirmation guide covering three lines moves by two lines at a time.

[0051]

When the user turned on the clearing switch to temporally stop the operation of the displaying device, the visual confirmation guide cannot be moved or deformed until the user turns off the same switch (in case of carrying out the instruction for deleting the visual confirmation guide, the data item 708, by using the clearing switch).

[0052]

The provision of the switching means for executing the function of the data item 707 or 708 enables the user to manually switch on and off the movement and deformation of the visual confirmation guide on the basis of the user's will. It is also possible to combine the manual control with automatic control

of movement or deformation of the visual confirmation guide according to the information on the movement and deformation patterns.

[0053]

It is also possible for user to manually move the visual confirmation guide instead of automated movement of the guide.

[0054]

Fig. 9 is a flowchart depicting an exemplified general processing procedure according to the second embodiment of the present invention (claim 4 to claim 10). The procedure for realizing, by way of example, the case of Fig. 8(d) will be described as follows:

Step S201 is a processing module for executing Steps S101 to S103 shown in Fig. 5. In this instance, the visual confirmation guide is assumed to have the following parameter values: The start and end addresses of the visual confirmation guide is at the top left corner and the bottom right corner of a remark display area (covering three lines) in Fig. 8(d), the polarity of its area is "positive", the pattern is "all black", the data deformation type is "no deformation", data attributes deformation is "white black inversion", the interval is "no interval" and the location of the visual confirmation guide is "within the area". The left image of Fig. 8(d) is obtained after executing Steps S101 to S103.

[0055]

Step S202 is a processing module for deciding whether to

start or stop moving/deforming process of the visual confirmation guide by referring to the start/stop information 707 of Fig. 7. Step S203 is a processing module for starting a moving/deforming process based on the decision made by Step S202. The moving/deforming process of the visual confirmation starts with the "start" information 707 the processing operation waits until the same process becomes possible to start by changing to "start" automatically after a specified time or turning on the switch of the start/stop instruction means with the "stop" information 707 (Step S210).

[0056]

Step S204 is a processing module for processing the movement of the visual confirmation guide, which is realized by the remark display control means according to the movement related parameters (Fig. 7). It is now assumed that the movement related parameters have the following values: A unit movement of the visual confirmation guide is a single line, a moving speed of the visual confirmation guide is 0.2 line/second, a movement pattern is of a constant speed and a moving direction of the visual confirmation guide is positive. Having obtained the movement related information, the remark display control means transfers the same information to the display control means that in turn performs the process according to the information. Namely, the visual confirmation guide moves in such a way that the address of the visual confirmation guide in the display buffer is moved as defined by the parameter values.

[0057]

Step S205 is a processing module for executing the deforming process, which is performed by the remark display control means by referring to the deformation related parameter values in the table of Fig. 7. It is now assumed that the deformation related parameters have the following set values: No deformation of the visual confirmation guide is made and deformation pattern is constant. Having obtained the deformation related information, the remark display control means transfers the same information to the display control means that in turn performs the process according to the information. Namely, the visual confirmation guide is deformed in such a way that the address of the visual confirmation guide in the display data buffer is deformed as defined by the parameter values. In this case, no deformation is made.

[0058]

Step S206 is a processing module for executing the process for deforming display data displayed under the visual confirmation guide or setting a display interval of the visual confirmation guide. Steps S104 to S107 as described referring to Fig. 5 are performed.

[0059]

Step S207 is a processing module for deciding whether to clear the visual confirmation guide. If the guide must be still displayed, the process proceeds to a remark display processing module (Step S208). If the guide must be cleared, the process

proceeds to a visual confirmation guide clearing processing module (Step S211). The content of the processing module S208 is similar to that of Step S108. Step S211 is realized by clearing the preset address information or all related information of the visual confirmation guide. The processing result of Step S208 or S211 is integrated into Step S209 (i.e., the content of Step S209 is similar to Step S109) whereat the processing operation (Step S109) described with reference to Fig. 5 is further executed.

[0060]

In consequence of the above processing, an image on the right side of Fig. 8(d) appears after 5 seconds.

[0061]

(Embodiment 3)

A third embodiment of the present invention (claim 11 or claim 12) will be described below. Figures 10(a) and 10(b) illustrate respective structures of data used for realizing the above embodiment. Fig. 10(a) shows a one dimensional data array for determining a movement pattern of the visual confirmation guide. Item 801 stores a duration of time (in milliseconds) for which the visual confirmation guide exists on display data (remark character display time) on the condition a unit movement of the a visual confirmation guide 701 is a single character and its movement pattern 703 is of a specified display time. The data is sorted in the character sequence defined by, e.g., the shift JIS code. Any character

can be identified by its sequence. Namely, numerical values shown in lines from top to bottom in Fig.10(a) represent time lengths of distinguishing characters 磁、示、而、耳 respectively. The operation of the embodiment of the present invention cannot be affected by any insertion in the i -th element of item 801 for representing an integer i that cannot be found in the normal shift JIS code. Any other code (e.g., JIS code, Unicode) may be used for defining the data sequence. The unit of character remark display time length may be of 1 clock of the system clock instead of millisecond unit.

[0062]

Fig. 10(b) is another representation of the data array of Fig. 10(a). Item 802 stores decimal numerical values representing respective characters of the shift JIS code and Item 803 stores time lengths of distinguishing corresponding characters visually. A variety of representation other than the above may be also used since the present invention has no intention to restrict types of representation of remark display time length.

[0063]

Although the described embodiment stores the remark display time length as a numeric value representing a time duration for which the visual confirmation guide retains on a unit of characters, the embodiment may also use a table storing parameters for determining a remark display time length and can acquire a necessary value as necessary.

[0064]

A method for setting a remark display time length is described below. It is logically desired to elongate a remark display time for a character or characters that may require the user to take a relatively longer time to read and understand. In other words, the visual confirmation guide has to be moved or deformed at a reduced speed in the above case. One way to achieve this is to elongate the movement and deformation speeds of the visual confirmation guide according to the complexity of respective kanji characters, which can be judged for example by the number of strokes composing each kanji character. For example, a longer remark display time is set for a kanji character “鬱” in comparison with a kanji character “討” since the former has the larger number of strokes than that of the latter.

[0065]

Another method for setting the remark display time lengths is based upon frequency of occurrence of respective kanji characters. That is, the remark display time length for respective characters is increased as the frequency of occurrence of them increases or decreases, which may be designed as an item selectable by the user according to the user's interest and will. In case if the remark display time is elongated with the lower occurrence frequency of characters, a kanji character “祁” is distinguished visually for a longer period than a kanji character “氣” since it appears in the

less number of times as compared with the latter.

[0066]

Although the above method has treated only characters as display data, it does not mean display data is limited to characters only. For example, an image may be displayed and distinguished visually for a time length preset according to its complexity or frequency of occurrence. The complexity of image data may be determined by the number of bits, the number of colors, the number of gradation levels and so on. Image number is used like the character codes. The frequency of occurrence is information independent from the kinds of information (such as characters and images).

[0067]

The remark display time length is not limited to a single character. For example, a total remark display time of characters contained within a visual confirmation guide may be set as a remark display time length for the visual confirmation guide.

[0068]

Fig. 10(c) shows a timetable for distinguishing a kanji character “示” visually. This character is distinguished within a visual confirmation guide for the time 804 preset as remark display time, then the visual confirmation guide is transferred to the next hiragana character “し” within the time 805 that is added to the time 804 to define the timing of transferring the visual confirmation guide from the

character “示” .

[0069]

The remark display processing operation using remark display time settings is as follows:

Fig. 11 is an exemplary flowchart depicting a remark procedure using remark display time settings. The control of the remark display time is concentrated on a transferring pattern among parameters for a visual confirmation guide. The operation will be described with further reference to the movement data processing portion shown in Fig. 9.

[0070]

Step S301 is a processing module for execution of processing operation to Step S203 included in the flowchart of Fig. 9. The remark display control means first refers to the movement pattern value 703 in the table of Fig. 7 (Step S302) for beginning the movement processing. In Step S303, the remark display control means examines whether the movement pattern value concerns the remark display time setting. If so, the remark display control means refers to the display data under the visual confirmation guide (Step S304) and, then, examines whether the display data consists of plural elements (Step S305). If the data does not include plural elements, the remark display control means determines remark display time for the display data referring to Fig. 10(a) (Step S306). If the data under the visual confirmation guide consists of plural elements, the remark display control means refers to remark display time

values for respective elements in Fig. 10(a) (Step S309) and then calculates a sum of the obtained values of the data elements to determine remark display time for a whole unit of the display data (Step S319). The remark display control means determines other parameters relating the movement of the visual confirmation guide (Step S307) and then proceeds to the deformation processing (Step S311). Step S319 determines the remark display time for the display data unit composed of plural data elements (e.g., characters) by a total of time values of the elements (characters) under the condition that the visual confirmation guide distinguishes a whole unit of the data (characters) visually and moves at a time by the length of the whole unit to cover the next data unit. However, in case that each travel of the visual confirmation guide is shorter than the length of a remark data unit of plural elements (characters), the remark display time may be set based on averaged time, maximum time, minimum time of each data element. It is also possible to determine the remark display time of a whole data unit by integration of units of remark display time.

[0071]

Although the remark display time is treated as one of parameters of a movement pattern of the visual confirmation guide in the above example, it may also be treated as one of parameters of deformation pattern 705 (Fig. 7).

[0072]

The display data remark display time based on the complexity

or frequency of display data can be decided by a method for directly defining the time as shown in Fig. 10(a). Alternatively, it can be determined by storing a method for extracting remark display time as described below.

[0073]

Representing, for example, remark display time by T and the number of strokes of a character by S , the time T is expressed as follows:

$T = \alpha S$, where α is a proportional constant.

[0074]

Representing frequency of a character by F , the time T is expressed as follows:

$T = \beta / F$, where β is a proportional constant.

[0075]

Consequently, the remark display time of display data can be determined by calculating the remark display time based on the number of strokes (complexity) of each character referring to a table for defining the correspondence of each character code to the number of character strokes. Similarly, the remark display time based on the frequency of each character can be determined according to the above equation by using a table prepared for indicating the correspondence of respective characters to frequency of their occurrence.

[0076]

The proportional constants α and β in the respective equations may be preset or adjusted by a user.

[0077]

(Embodiment 4)

Next, the forth embodiment according to the present invention will be described (claim 11 to claim 13). Figures 12(a) and 12(b) show exemplary data structures of tables defining remark display time values, which are used for explaining another example of remark display of characters (display data) based on the frequency of their occurrence. Table of Fig. 12(a) shows that a preceding character 810 and a subsequent character 811 are enhanced for time 812. Remark display time 812 is determined based on joint frequency of preceding and subsequent characters. (The term "probability" may be also used instead of the term "frequency". The probability and the frequency can be converted to each other by defining proportional constants. They are not different in substance from each other.) For example, the entry (昆、虫、0.02) indicates that the probability of occurrence of the subsequent character 虫 after the preceding character 昆 is 0.02. Similarly, the entry (玉、虫、0.01) indicates that the probability of occurrence of the subsequent character 虫 after the preceding character 玉 is 0.01.

[0078]

A reason for determining the remark display time based on the joint frequency or probability of characters is as follows: For example, a kanji character 阜 is usually of low frequency in use while a word 岐阜 (the name of a district in Japan) is

frequently used. Since the character 岐 is usually of low frequency in use, the probability of occurrence of the character 阜 after the character 岐 is considerably high. On the contrary, information content of the character 阜 when occurred after the character 岐 is small. A character 日 is of high frequency in use but no word 岐日 is used. Hence, the probability of occurrence of the character 日 after the character 阜 is very low. This means that the character 日 has a large information content. It is reasonable to set longer time of distinguishing characters having larger information content.

[0079]

For easy understanding, tables of Figs. 12(a) and 12(b) show the characters in replace of corresponding character codes stored in practice.

[0080]

It is not practical to store entries for all combinations of characters in the remark display time reference table Fig. 12(a). Therefore, its entries are limited only to characters of high joint probability and other characters are stored with usual probability (frequency) in singular use. For example, the remark display time reference table is constructed of two tables, one of which stores remark display time values based on joint probability of characters as shown in Fig. 12(a) and the other stores remark display time values based on probability of each character as shown in Fig. 10(a) or 10(b).

[0081]

In this case, the remark display control means examines the table consisting of three value's combination in a table of Fig. 12(a) by using a current character and a just preceding character as keys. Having found the corresponding entry, the remark display control means extracts the probability value of the current character from the entry. If no entry was found in the table, the remark display control means can easily retrieve the probability value of the current character from the entry of Fig. 10(a) or Fig. 10(b). Another aspect of the invention can be realized as follows: For example, only joint probability of a combination of characters is acquired from the table shown in Fig. 12(a). The table of Fig. 10(a) or Fig. 10(b) which don't consider the joint of character aren't used. If no relevant entry was found in the table, each of the characters is given a constant probability value.

[0082]

A data unit to be distinguished visually may be, instead of the specified number of data (e.g., characters), a word of variable length. Fig. 12(b) shows a table for distinguish the display data visually on the word by word basis, in which combinations each of a word and its remark display time value are stored. In the practice, the shown characters are replaced by corresponding character codes. In Fig. 12(b), "END" is a terminating symbol placed after each word and indicates the word consists of a character string starting from an entry 813

on the left side of the symbol "END". "END" is given a code different from a character code (for example, it may have a decimal code 65535 according to the shift JIS). A numeric value on the right side of "END" relates to the probability of occurrence of the word.

[0083]

The remark display control means compares display data (a word consisting of a character string) captured by the visual confirmation guide with each character string on the left side of each "END" symbol in the table of Fig. 12(b). When a match is found, the remark display control means acquires a probability value shown on the right side of the "END" symbol.

[0084]

A period of time T for distinguishing the word visually can be determined by converting the probability value according to the following equation.

$$T = \Gamma / F \text{ (where } \Gamma \text{ is a proportional constant)}$$

[0085]

Although the embodiments 3 and 4 determined the remark display time based on the data complexity and the data frequency respectively, it is possible to determine the remark display time for display data according to the combination of the complexity and frequency of data being displayed within the visual confirmation guide.

[0086]

(Embodiment 5)

The functions and operation of the remark display control means have been described above. Now, the fifth embodiment of the present invention, which relates to an human interface of the data displaying device according to the present invention, will be described below.

[0087]

Figs. 13(a) and 13(b) are external views of a data displaying device according to the present invention. Fig. 14 shows an exemplary menu screen for setting parameters of remark display. In Fig. 13(a), numeral 901 designates a display means or display data and numeral 902 designates a switch button for control of start/stop of the remark display. With display data being displayed on the display means, the switch button 902 is pressed to start distinguishing the display data visually. With the data being distinguished visually, the switch button 902 is pressed to clear the remark display.

[0088]

A switch button 903 is a two functional switch for control of moving direction of a visual confirmation guide and for temporally stopping the remark display. For example, in case of changing the above functions with the default value set to the forward direction, the user repeats pressing of the switch button 903 to a desired function. Every pressing of this button changes the function to pausing, reverse moving and forward moving of the visual confirmation guide and the pausing again. A switch button 904 is used for setting parameters relating

to the visual confirmation guide. Pressing this button causes a menu to appear on the display screen as shown in Fig. 14. A selector (dial or switch) 905 is used for selecting parameters of moving speed, deforming speed and blinking speed of the visual confirmation guide. A degree of change can be adjusted by turning this dial (or switch). Turning the dial 905 can also be used for selecting setting items of the menu for setting the visual confirmation guide parameters, which menu is displayed by pressing the button 904. The dial 905 can be used as a pointing device if it is provided with a sensor for detecting a direction of a force applied thereto.

[0089]

Fig. 13(b) is an external view of a data displaying device having two display screens in its spread state. Control components similar to those of the device of Fig. 13(a) are given the same reference numerals.

[0090]

It should be noticed that types, quantity and arrangement of selecting means (switches 902 to 905 in the shown case) are not limited to those shown in Figs. 13(a) and 13(b). The device may be designed with any other type, quantity and arrangement of the selecting means.

[0091]

Fig. 14 shows a menu for setting parameters of the visual confirmation guide, which menu appears on a screen by pressing the switch button 904 shown in Fig. 13(a). Items of the menu

are items selectable from plural candidates, settable numerical values and analog display data. The menu is not limited to the shown example. It may have other different items in different arrangement.

[0092]

An embodiment of claim 14 or 15 is obvious due to the above explanation so that the embodiment isn't explained here.

[0093]

[Effect of the Invention]

The present invention offers an advantageous effect for realizing easy reading document data (display data in the above description) distinguished visually by setting a visual confirmation guide base on a difference of its visibility from the other areas on the display screen. This cannot be realized by the prior arts.

[0094]

A visual confirmation guide (remark area) on a document image can be moved in accord with its content by using content related parameters such as the complexity and frequency of occurrence of document data.

[0095]

A variety of distinguishing the document data visually can be realized by setting parameters or using user's interface in addition to reverse video, which may be selectively applied in accord with the environmental conditions for the device or the user's preference.

[0096]

The remark document can be moved by a unit distance: one character, several characters, line, sentence, paragraph or section, any one of which can be selected in accord with the environmental operating conditions or user's preference.

[0097]

Timing control of the remark display can be executed by inducing parameters such as a remark interval, moving pattern, deformation pattern, etc.

[0098]

A document data area to be distinguished visually can be dynamically changed in accord with the content or the user's preference by deforming the visual confirmation guide.

[0099]

A moving speed of the remark document data can be set by adjusting the moving speed of the visual confirmation guide to match the user's reading speed.

[0100]

The moving direction of the remark document data can be easily changed to the forward or reverse direction.

[0101]

The same visual confirmation guide can be used for both dynamical distinguishing and statistical distinguishing of the document data. This facilitates construction of the device system.

[0102]

The remark display can be easily executed by simply pressing a start/stop button.

[0103]

The visual confirmation guide prevents the user from missing a line or repeatedly reading the same line when reading a page full with characters and lines or a page written in a complex style.

[0104]

The visual confirmation guide is effective to keep the reader's eyes on a correct line on a page even with display screen vibration that may occur when reading the book, e.g., in a train.

A period of time for distinguishing each word or words visually can be adjusted according to the complexity or frequency of the word or words. Namely, a term difficult to read or understand can be distinguished visually for a longer time. This may help the user in understanding the document content.

[0105]

The integration of the above advantageous effects ensures the user enjoying reading of the document data on the display screen with easier operation and increased pleasure.

[Brief Description of the Drawings]

Figure 1 is a functional block diagram of a first embodiment of the present invention.

Figure 2 is an exemplary data structure for displaying a

visual confirmation guide.

Figures 3(a) to (c) are views for explaining a method of remark display data by representing in inverse color.

Figures 4(a) to (j) show exemplary remark display methods other than the examples shown in Figs. 3(b) and 3(c).

Figure 5 is a flow chart depicting the processing steps for exemplary remark display methods shown in Figs. 3(b) and 3(c) or Figs. 4(a) to 4(j).

Figures 6(a) to (d) are exploded views of Fig. 4(d).

Figure 7 depicts an exemplary data structure for realizing a second embodiment of the present invention (claim 4 to claim 10).

Figures 8(a) to (d) show examples of moving a visual confirmation guide along images being displayed on a screen.

Figure 9 is a general flowchart depicting the processing steps of the second embodiment of the present invention (claim 4 to claim 10).

Figures 10(a) to (b) show exemplary data structures for realizing a third embodiment of the present invention (claim 11 or claim 12).

Figure 11 is a flowchart depicting the processing steps of an exemplary method for remark display data by using a specified remark display time.

Figures 12(a) to (b) show exemplary data structures of tables defining a time length of remark display, which tables are used for another example of remark display by using the

frequency of display data occurrence.

Figures 13(a) to (b) are external views of exemplary data displaying devices according to the present invention.

Figure 14 shows an exemplary menu screen for setting parameters of remark display.

[Explanations of Letters and Numerals]

- 101 Storage Means
- 102 Display Means
- 103 Display Control Means
- 104 Remark Display Control Means
- S101 Module For Setting A Visual Confirmation Guide Address
- S102 Module For Setting A Visual Confirmation Guide Polarity
- S103 Module For Position-Processing A Visual Confirmation Guide Area
- S104 Module For Setting A Visual Confirmation Guide Pattern
- S105 Module For Change-Processing Attribution Of Display Data
- S106 Module For Deform-Processing Display Data
- S107 Module For Setting A Remark Display Interval
- S108 Module For Practicing Remark Display
- S109 Module For Decision-Processing The End
- S110 Module For End-Processing
- S111 Module For Preparation-Processing For Setting Next Visual Confirmation Guide

FIG.1

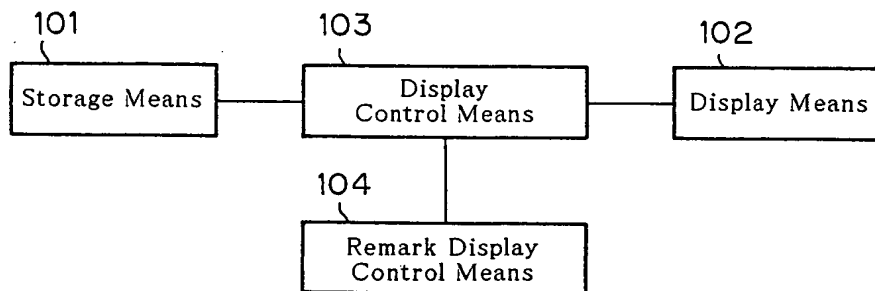


FIG.2

Start Address of Visual Confirmation Guide	(X1,Y1)	201
End Address of Visual Confirmation Guide	(X2,Y2)	202
Polarity of Visual Confirmation Guide Area	Positive	203
Visual Confirmation Guide Pattern	(Frame 1, Black)	204
Deformation Pattern of Display Data	(Enlargement 100%, Rotation 0°)	205
Variation of Display Data Attribution	(Black, Font Style "Mincho")	206
Interval	(Blinking at 5-second intervals)	207
Location of Visual Confirmation Guide Area	Within the specified area	208

FIG.3

(a)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
本発明による電子書籍または書籍の図も別に示した。携帯に適していることが分かる。表示された文書の一部が強調されている様子に注意。

(b)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
本発明による電子書籍または書籍の図も別に示した。携帯に適していることが分かる。表示された文書の一部が強調されている様子に注意。

(c)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
本発明による電子書籍または書籍の図も別に示した。携帯に適していることが分かる。表示された文書の一部が強調されている様子に注意。

FIG. 4

(D)

ユーザが内容を読み取りやすいように、これによって行を飛ばしてしまふことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。

本書の図も別に電子版と紙版の両方に用いられていることが分かる。添字された文章の一部が強調されている様子にも注意。

(b)

ユーザが内容を誤り取りやすいうようにガイドを設けた。これによって行を飛ばしてしまふことが防げるのが大きな特徴であり、移動中の使用にも非常に適していることは文を参照のこと。

本邦の明にも示した通りには善く解明も所にも欠ける。特筆すべきは著者が十分分かる。表示されていることとが分かっていて、一文節一語に注意する様子

(c)

[illegible]

(b)

第の図も別に表示した。

(e)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまふことが防げるが大変な負担であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。

本誌の別冊にも別冊「電子書籍の読みの原則」がある。読者に適した使い方を示していることが分かる。一部、本文書と重複しているところも注意される。

(f)

ユーザが内容を読み取りやすすに
よって行を改めた。これに
よって行を改はしてまうこと
が防げるのが大きな特徴であり
移動中の使用にも非常に適して
いると考えられる。具体的な内
容は本文を参照のこと。
本報の図にも示した通り、本
報の図も例に電子データは通
して行を改はしてまうことが分
かるといふことが分かる。表
示された文章の一部が強調され
ていて、これに注意を

(b)

ユ一ザ一が内容等を簡単に取ります。これは、
 ようにガイドを飛ばしてしまふこと
 ように行を飛ばしてしまふこと
 が防げるのが大きな特徴であり
 移動中の起用にも非常に適して
 いると考えられる。具体的な内
 容は本文を参照のこと。
 本発明明による電子書籍または書
 籍の図も別図に示す。

(4)

ユ一ザ一が内容を取りやすいようにガイドを附けた。これによって行を飛ばしてしまふことが防げることが大きい特徴であり移動中の使用にも非常に適していると考えられる。具体的な事は本文を参照のこと。本発明による電子書籍は、通常の図や別添に示した、書籍に添

(ii)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまふことが防げるのが大きな特徴であり、移動中の使用にも非常に適している。本文を参照すること、本文図にも応じて、例えば本書の図に示すように、表示されていることが分かる。表示されていることは、一語一語を細かく見ることが出来る。

(ii)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまふことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。

本図例にもよって示される。無茶に書かれた図にも気が分かっていて、文書の一部が強調されていることが分かる。

FIG.5

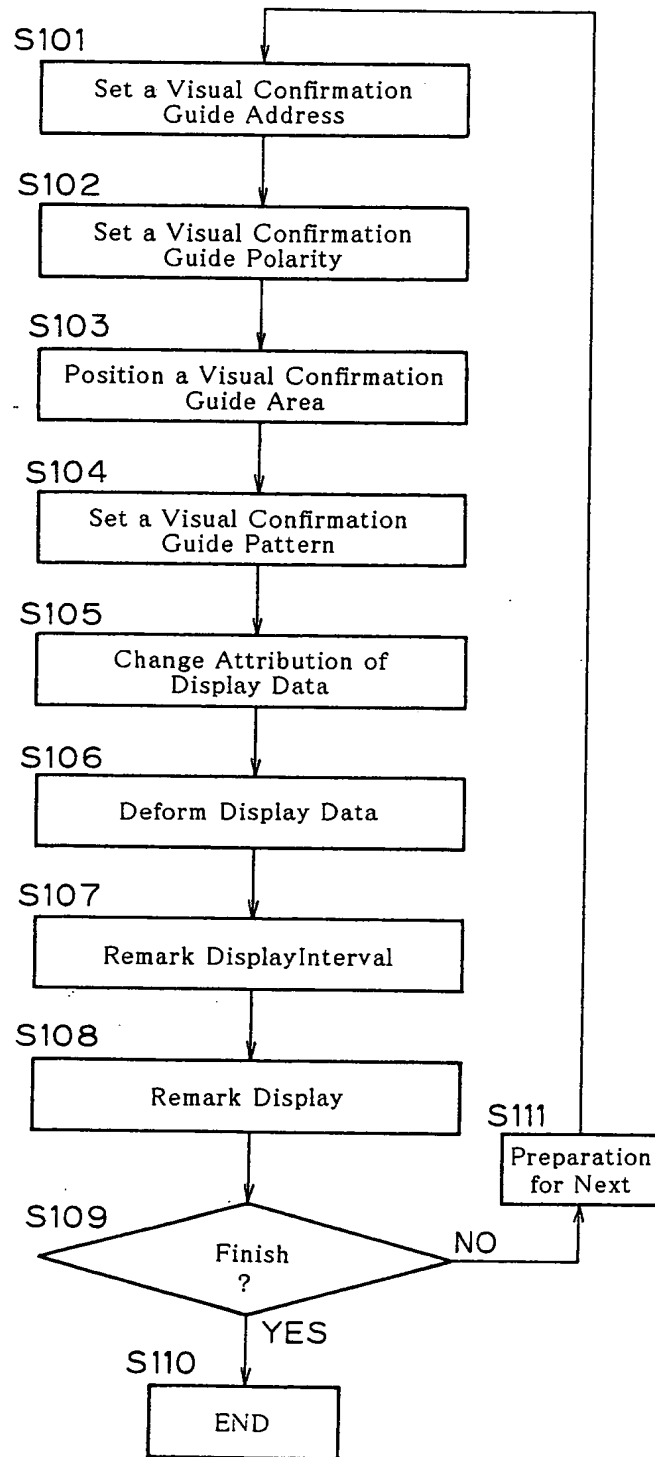


FIG.6

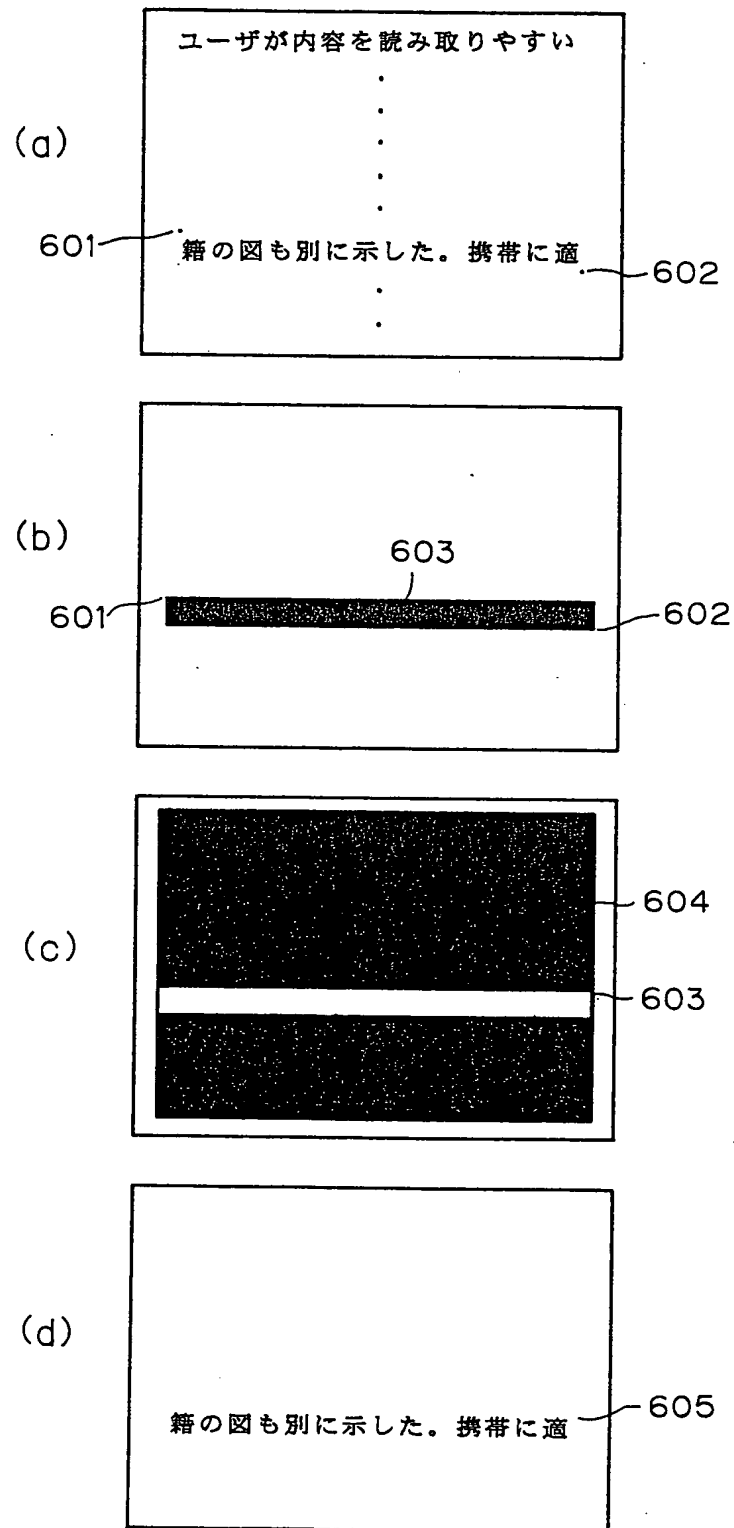


FIG.7

Movement of Visual Confirmation Guide	Line	701
Moving Speed of Visual Confirmation Guide	0.2 x Movement/sec.	702
Movement Pattern	Constant	703
Deformation of Visual Confirmation Guide	No	704
Deformation Changing Pattern of Visual Confirmation Guide	Constant	705
Moving Direction of Visual Confirmation Guide	Positive Direction	706
Start/Stop	Stop	707
Releasing Visual Confirmation Guide	Not releasing	708

FIG.8

(a)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
本発明による電子書籍または書籍の図も別に示した。携帯に適用していることが分かる。表示された文書の一部が強調されている様子に注意。



(b)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
本発明による電子書籍または書籍の図も別に示した。携帯に適用していることが分かる。表示された文書の一部が強調されている様子に注意。



(c)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
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(d)

ユーザが内容を読み取りやすいようにガイドを設けた。これによって行を飛ばしてしまうことが防げるのが大きな特徴であり移動中の使用にも非常に適していると考えられる。具体的な内容は本文を参照のこと。
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FIG.9

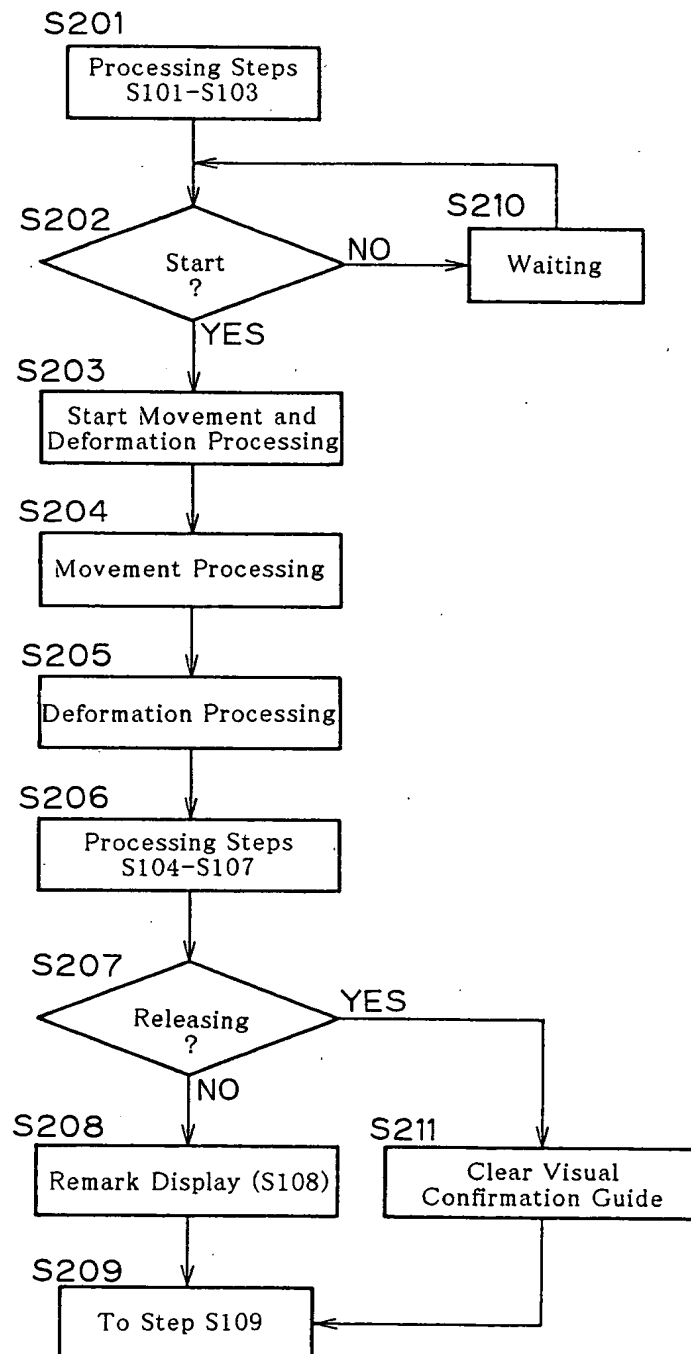


FIG.10

(a)

801

.
250
200
200
150
.

(b)

802	803
.	.
36517	250
36518	200
36519	200
36520	150
.	.

(c)

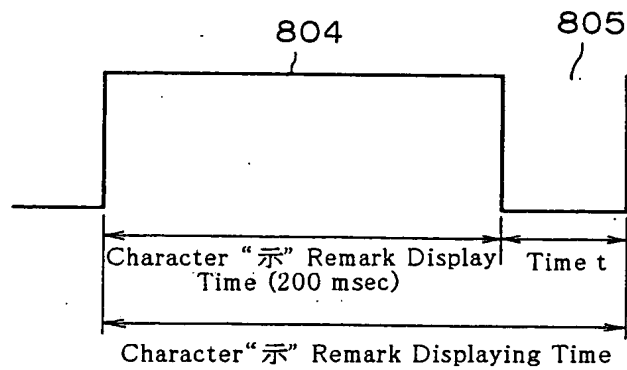


FIG.11

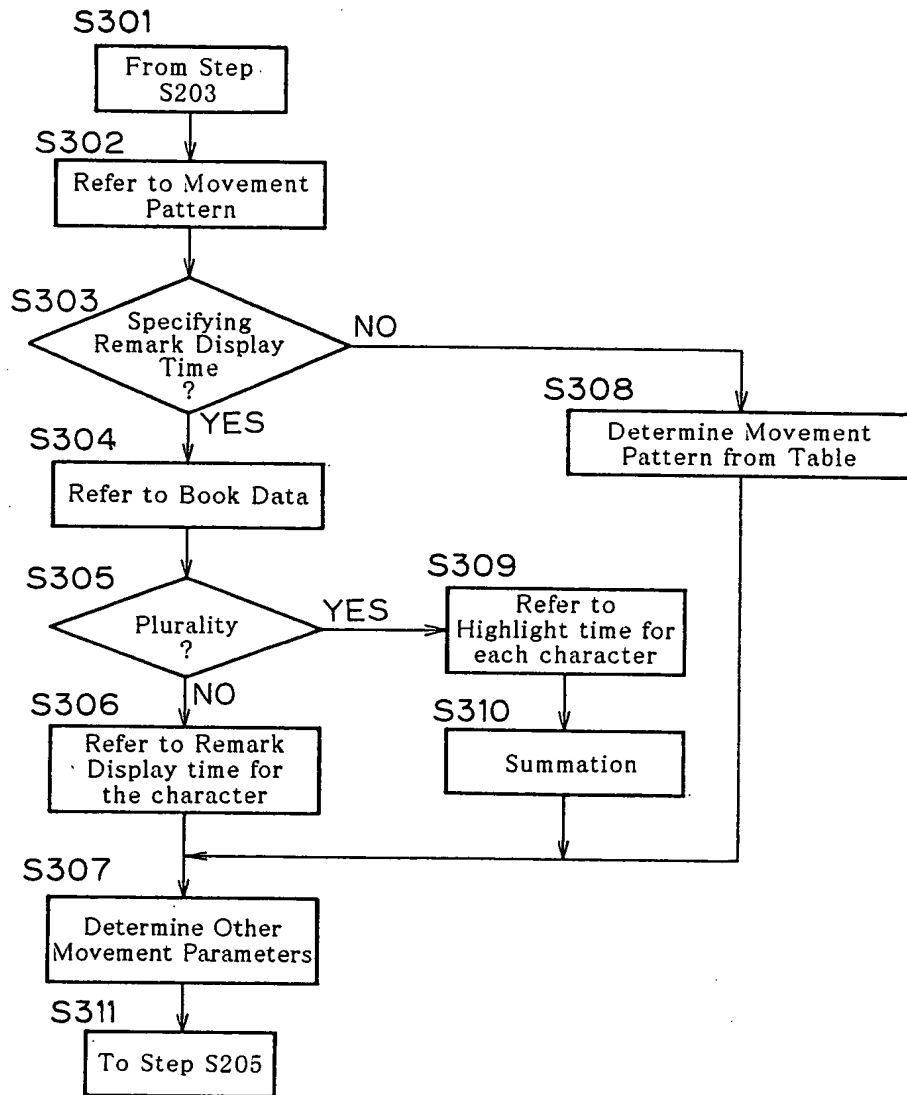


FIG.12

(a)

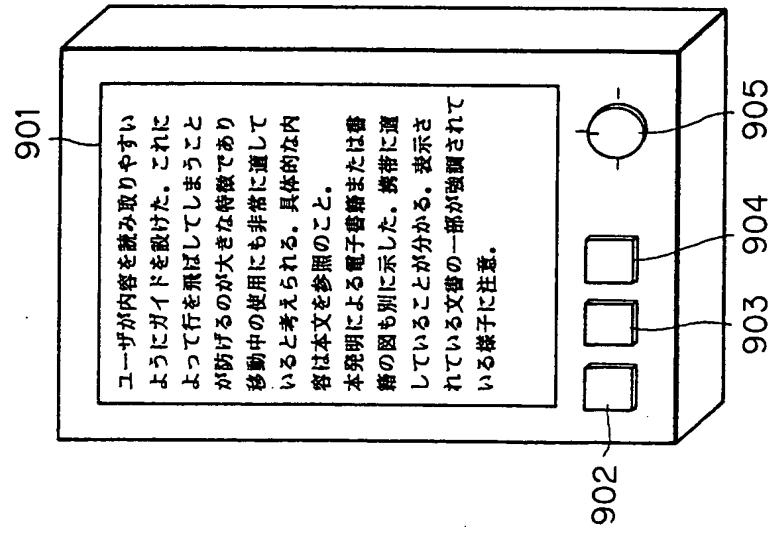
810	811	812
.	.	.
昆	虫	0.02
玉	虫	0.01
松	虫	0.01
常	駐	0.005
.	.	.

(b)

813				
.
昆	虫	END	0.02	
玉	虫	色	END	0.005
駐	車	END	0.02	
常	駐	END	0.01	
.

FIG.13

(a)



(b)

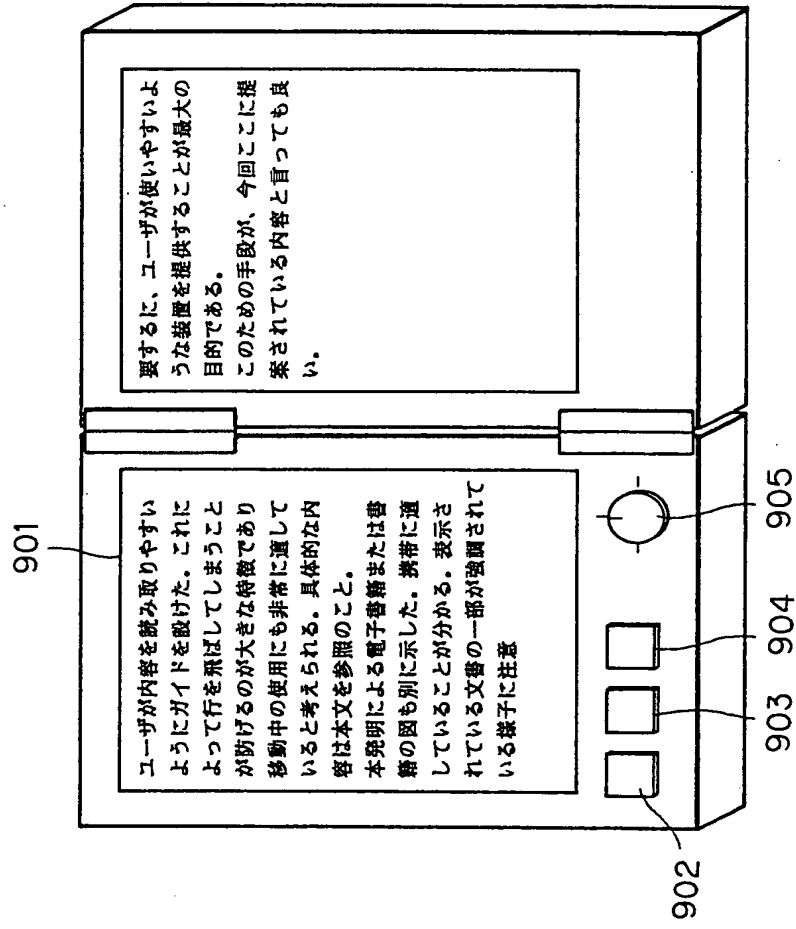


FIG.14

Menu for setting parameters of a
visual confirmation guide

906 Remark unit: ☒ Character ☐ Word ☐ Line

907 Remark area: 3 (characters, words or lines)

Remark Display moving speed

908 ☒ Slow ☐ Quick

Remark
method Reversal ☒ Enlargement ☐ Flash ☐ Boldface

※ Values enclosed in rectangles have
been selected.

[Document Name] Abstract

[Abstract]

[Object]

Conventional data displays and electronic book devices involve the problem that the operation to distinguish displayed data visually is complex, and therefore the displayed data cannot be read easily depending on the environment where the reader (user) uses the device and on the understanding of the displayed data by the user.

[Solving Means]

A data displaying device of the invention comprising storage means stored with data, display means for displaying data, and display control means for controlling the display of data stored in the storage means on the display means is characterized by further comprising a remark display control means for displaying a visual confirmation guide for distinguishing a specific range of the data displayed on the displaying means visually.

[Selected Drawing] Fig. 1